minute and then was broken up, all the birds walking off across the desert and feeding.

These observations seem to confirm beyond doubt the method by which these sandgrouse bring water to their young. I may add, however, that on 18th August, from 0800 to 1135 I watched a pair of *P. senegallus* with two young, no more than a week old and unable to fly. While I watched, the adults never left the young which surprised me because I had expected to see "watering" behaviour during this period. Presumably, then, if "watering" is performed daily, its time is more irregular than one would have imagined.

Remarks on the taxonomy of *Turdus nigrilorum* Reichenow and *Turdus saturatus* (Cabanis) in Southern British Cameroons

by William Serle

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Turdus nigrilorum was described by Reichenow (*Ber. Allgem. deutsch. orn. Ges. Marz* 1892), the type locality being Buea on the Cameroon Mountain at an altitude of 950 metres (about 3,100 feet). Reichenow compared his new form with *Turdus chiguancoides* Seebohm, and in his original description he mentioned the grey-brown flanks and the fulvous-brown axillaries of *nigrilorum*.

For a number of years opinion has been divided over the status of *T. nigrilorum*, some treating it as a full species and others treating it as conspecific with the wide ranging *Turdus libonyanus* (Smith) of which the representative in the area surrounding the Cameroon Mountain is *T. l. saturatus* (Cabanis).*

The type locality of *saturatus* is Duala, on the Cameroons coast and only twenty-five miles from the base of the Cameroon Mountain. The type specimen of *saturatus* is an extremely worn bird. The flanks are washed orange-chestnut and the axillaries and under wing-coverts are clear orange-chestnut.

In the hope of determining the relationship of *nigrilorum* and *saturatus* I collected a series of the two forms on the Cameroon Mountain and on the plain between the base of the mountain and the sea, at altitudes from sea level up to 9,500 ft. Comparing the two forms, in fresh adult plumage, in *nigrilorum* the upper parts are a shade darker as are the lores, and the middle of the throat and breast a shade greyer and less brown, but these are trifling differences. The only good character lies in the flanks, the axillaries and under wing-coverts. The orange-chestnut wash on the flanks of *saturatus* is absent in *nigrilorum* and the axillaries and under wing-coverts instead of being clear orange-chestnut are only tinged with orange-chestnut, and the outer under wing-coverts are hardly even so tinged.

On the character of the flanks, axillaries, and under wing-coverts the thrush of the upper slopes of the Cameroon Mountain is clearly *T. nigrilorum*, the thrush of the lowest slopes of the mountain and the adjacent coastal plain is *T. saturatus* and there is a fairly narrow altitudinal zone on the lower slopes of the mountain occupied by intermediates between *nigrilorum* and *saturatus*.

In the series collected by me the following are assigned to *T. nigrilorum*.

1 ♀; Saxenhof; 1,700′; Wing 109 mm.; Tail 77 mm.
1 ♀; above Mimbia; 3,300′; W. 114; T. 75.
1 ♂; above Buea; 3,400′; W. 111; T. 76.
1 ♂; 1 ♀; above Buea; 4,000′; W. 115, 109; T. 82, 74.
1 ♂; above Buea; 4,000′; juvenile.
2 ♀; above Buea; 4,500′; W. 104, 109; T. 74, 77.
1 ♀; above Buea 5,000′; W. 108; T. 75.
1 ♀; above Buea 5,500′; juvenile.
2 ♀; Mann's Spring; 7,400′; W. 109, 111; T. 76, 81.
1 ♀; above Buea; 9,500′; W. 109; T. 77.

The following are assigned to *T. saturatus:*—

6 ♂, 1 ♀; Victoria; sea level; ♂, W. 107, 110, 111, 111, 113, 115; T. 79, 79, 84, 84, 83, 82; ♀ juvenile.
1 ♂; Missellele; sea level; W. 112; T. 82.
1 ♂; Powo; 600′; W. 110; T. 79.
1 ♂; above Bota; 1,000′; W. 109; T. 77.
1 ♂, 2 ♀; near Ekona; 1,200′; W. 113, 108, 109; T. 83, 80, 77.
1 ♂, 1 ♀; near Ekona; 1,400′; W. 110, 106; T. 81, 77.
1 ♀; Bonikando, 2,100′; W. 107; T. 81.
1 ♀; above Saxenhof, 2,300′; W. 111; T. 80.

The following are intermediates nearer to *nigrilorum* than to *saturatus:*

2 ♂; near Saxenhof; 1,700′; W. 111, 112; T. 86, 82.
1 ♀; near Saxenhof; 2,000′; W. 107; T. 77.
1 ♂; Tole; 2,000′; W. 114; T. 82.
1 ♂; above Mimbia; 3,200′; W. 109; T. 80.

The following are intermediates nearer to *saturatus* than to *nigrilorum:*—

1 ♂; Ekona; 1,200′; W. 115; T. 81.
1 ♂; near Saxenhof; 1,700′; W. 113; T. 81.
1 ♀; near Saxenhof; 1,800′; W. 109; T. 76.
1 ♂; Lisoka; 1,900′; W. 117; T. 85.
1 ♂; above Bonikando; 2,900′; W. 112; T. 78.
1 ♂; above Buea; 3,500; W. 116; T. 82.

In brief, the specimens of *nigrilorum* were all collected at altitudes between 3,300′ and 9,500′ except one at 1,700′. The specimens of *saturatus* were all collected between sea level and 1,400′ except one at 2,100′ and one at 2,300′. The intermediates were all collected between 1,200′ and 2,000′ except one at 2,900′, one at 3,200′, and one at 3,500′.

The series shows that *T. nigrilorum* and *T. saturatus* are conspecific, being races of *T. libonyanus; nigrilorum* of the Cameroon Mountain being a montane representative of the species.

The altitudinal range of *T. nigrilorum*

Several of the Cameroon Mountain true montane forms occur as low as about the 1,700′ contour but no lower. Only exceptionally are any montane forms encountered below 1,700′. The dividing line between *T. nigrilorum* and *T. saturatus* is also about the 1,700′ contour. The upper altitudinal limit of *nigrilorum* is 9,500′, the height of the highest forested ravines.

Turdus nigrilorum compared with the other montane birds of the Cameroon Mountain.

Generally speaking the peculiar montane forms of the Cameroon Mountain are not closely related to lowland forms in the country surrounding the mountain but have their nearest relatives in the highlands of

East and Central Africa. *T. nigrilorum* is an exception for it is am ontane representative of a wide ranging predominantly lowland species and it intergrades with the race of that species inhabiting the lower slopes of the mountain and the adjacent lowlands.

Turdus libonyanus in its Southern Cameroons range apart from the Cameroon Mountain district.

A series of *T. libonyanus* collected by me in various localities in British Cameroons, including the Bamenda Highlands, are all *T. l. saturatus* and cannot be distinguished from a nearly topotypical series collected at Victoria:—

5 ♂; 5 ♀; near Kumba; 700′–1,200′; ♂, W. 114, 114, 115, 116, 117; T. 86, 83, 87, 83, 89: ♀, W. 106, 110, 110, 111, 113; T. 81, 83, 85, 81, 83.
1 ♂; Tombel; 1,500′; W. 114; T. 86.
1 ♀; Manenguba Mountain; 6,500′; W. 110; T. 77.
1 ♂; Foto; 5,200′; W. 115; T. 86.
1 ♂; Bafut; 4,500′; W. 116; T. 85.
1 ♂; Bamenda; 5,500′; W. 113; T. 85.
1 ♀; Kishong; 6,400′; W. 110; T. 80.
1 ♀; Oku; 7,000′; W. 120; T. 83.

Variation in wing and tail measurements in *T. l. nigrilorum* and *T. l. saturatus*.

In this series of *nigrilorum* and *saturatus* the wing and tail lengths of males average a few mms. more than those of females. There is no difference in wing length between *nigrilorum* and *saturatus*. In *saturatus* wing length and tail length is unaffected by altitude or locality. The tail length of *nigrilorum* averages a few mms. less than that of *saturatus*.

Juvenile plumage of *T. l. nigrilorum*.

The juvenile *nigrilorum* is distinguished from juvenile *saturatus* by the same characters distinguishing the adults of the two forms, namely the colour of the flanks, axillaries and under wing-coverts. In *nigrilorum* the light tipped upper wing-coverts remain for some time after the disappearance of the other juvenile plumage characters.

* Chapin and some other recent authors regard *saturatus* as a race of *Turdus olivaceus* Linn., but for the purpose of this note I follow Sclater (*Syst. Av. Aeth.* ii. 1930, p. 440), placing it with *libonyanus*.

The affinities of the Red Avadavat, *Amandava amandava* (Linn)

by C. J. O. Harrison

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INTRODUCTION

There have been several recent revisions of the Estrildidae. Delacour (1943) recognised in his revision the existence of three main divisions or tribes—the waxbills, Estrildae; the grassfinches, Erythrurae; and the mannikins, Amadinae. With the suffix now used to indicate tribal rank these would become Estrildini, Erythrurini, and Amadinini. Morris (1958) studied the comparative ethology of the two latter tribes and suggested some modifications of Delacour's arrangement. Wolters (1957) and Steiner (1960) also revised the Estrildidae. The former used no tribal divisions; the